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CANADIAN HORTICULTURAL HISTORY

an interdisciplinary journal

HISTOIRE DE L'HORTICULTURE AU CANADA

revue interdisciplinaire

Vol. 1, No. 2, 1986

CENTRE FOR CANADIAN
HISTORICAL HORTICULTURAL STUDIES
ROYAL BOTANICAL GARDENS

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an interdisciplinary journal

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CENTRE FOR CANADIAN
HISTORICAL HORTICULTURAL STUDIES
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The Centre for Canadian Historical Horticultural Studies (CCHHS) was established at the Royal Botanical Gardens, Hamilton, Ontario, in 1979 through an endowment from the Dunington Grubb Foundation. The functions of CCHHS are to collect documentation on all aspects of the history of Canadian horticulture and to facilitate publication of original research in its journal Canadian Horticultural History .

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Le Centre for Canadian Historical Horticultural Studies (CCHHS) a été créé au Royal Botanical Gardens de Hamilton (Ontario) en 1979 grâce à une donation de la fondation Dunington Grubb. Le CCHHS a pour mission de recueillir des documents sur tout ce qui concerne l'horticulture canadienne et de permettre la publication d'études originales dans sa revue intitulée Histoire de l'horticulture au Canada

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TECHNICAL PROBLEMS IN TRANSPORTING LIVING PLANTS IN THE AGE OF SAIL

Ray Desmond

India Office Library and Records,
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Abstract

An account of some of the methods used in the transportation of plants and seeds between North America and Europe during the 18th and 19th centuries. The initial difficulties in collecting plants in wild and inhospitable country and getting them safely to the coast were followed by the problems of keeping them alive during the Atlantic crossing. Plants suffered during the voyage from climatic conditions, effects of salt spray and lack of attention. Cargoes were also lost through shipwreck, encounters with pirates and frequent naval engagements when any plants on board were invariably the first part of the cargo to be jettisoned. Printed instructions on the collection and care of plants and seeds were distributed to collectors and sailors. Seeds, packed in bags, tins or bottles, were protected in a variety of ways: buried in dry sand, packed in oakum or rope fibre, coated with resin or wax. By the early 19th century most plants were being despatched in stout, portable boxes with glass lids. A development of this container was the hermetically sealed case invented by Nathaniel Ward in the 1830s. This dramatically reduced the mortality rate among plants and remained the standard method for their transportation until superseded by air transport.

Résumé

L'article décrit quelques méthodes employées pour le transport des plantes et des graines, entre l'Amérique du Nord et l'Europe, pendant le 18e et 19e siècles. Dans un pays à la nature sauvage et inhospitalière, la cueillette et l'envoi sur la côte est de plantes présentaient de nombreux obstacles. Puis, suivaient les problèmes de leur conservation durant la traversée de l'Atlantique, lors de laquelle les plantes souffraient des mauvaises conditions climatiques, de l'effet du sel des embruns et du manque d'attention. Des cargaisons étaient aussi perdues lors de naufrages, de combats avec des pirates et de batailles navales pendant lesquelles toutes plantes à bord étaient immanquablement les premières jetées à la mer. On distribua aux cueilleurs et aux marins des instructions écrites sur la récolte et les soins à apporter aux plantes. Les graines furent empaquetées dans des sacs, des boîtes en fer-blanc ou des bouteilles et protégées de différentes façons: ensevelies sous du sable sec, emballées dans de la fibre de corde ou d'étoupe, recouvertes de résine ou de cire.

Au début du 19e siècle, on expédiait la plupart des plantes dans de solides boîtes, transportables, munies de couvercles vitrés. Vers les années 1830, Nathaniel Ward améliora ce type de conteneur en fabriquant une caisse scellée hermétiquement. Ceci contribua grandement à réduire le taux de mortalité des plantes et demeura la méthode employée jusqu'à ce que le transport aérien remplace le transit par bateau.

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*This paper was presented at the symposium "To those faire plantations. 350 years of plant exchange between Britain and the New World", October 19, 1984, at the Royal Botanical Gardens, Hamilton, Ontario.

When the early settlers in North America sowed the seeds of familiar plants from their native land they were merely doing what most migrants to a new country have always done. The successive waves of invaders for instance of the British Isles brought with them barley, oats, the vine, the fig, the sweet chestnut, the walnut and the cultivated apple.

The earliest known record of a plant-collecting expedition is carved in relief on the stones of an Egyptian temple at Thebes. In 1495 BC Queen Hatshepsat sent a party to Punt (presumably Somalia) to collect incense trees. The reliefs show entire trees with their roots protected in baskets being carried on board ship for the sea voyage to Egypt. Many centuries later Marco Polo reported that the great Kublai Khan had choice trees dug up in countries he had invaded or conquered and carried back by elephant for planting in China. Brute force and luck must have been very much in evidence in these primitive attempts at moving plants. However more subtle and seemingly scientific methods were gradually evolving. The anonymous fourteenth century author of *Le Menagier de Paris* explained how the shrub, Rosemary, could be safely transported by wrapping it in waxed cloth, sewing it up, smearing the parcel with honey, and finally generously powdering it with wheaten flour. Then, concluded the author confidently, "you may send them wheresoever you will".

In my paper today I propose examining the techniques used mainly in the eighteenth and early nineteenth centuries to convey seeds and plants, particularly between North America and Europe.

Many of the foreign plants reaching Europe during the seventeenth and eighteenth centuries came from North America because the sea voyage was not too long for their survival and there were also similarities in the climate. It has been estimated that of some 500 different species of hardy trees and shrubs introduced into Britain by the end of the seventeenth century, 350 of them emanated from North America. Bishop Compton's garden at Fulham Palace, was famous for its display of American plants which he received largely from John Banister in Virginia between 1680 and 1692. Woody plants and perennials were preferred since their seeds, if the plants survived the sea voyage, would once they had germinated, maintain themselves indefinitely, even if they never produced seeds in their new habitat. Annuals, on the other hand, could only be sent as seeds and if they in turn failed to produce seeds they could only be replenished by expensive regular shipments across the Atlantic.

The experience accumulated in transporting plants and seeds eventually led to the compilation of some basic principles for their collection and despatch. In 1696 John Woodward presented to the Royal Society his *Brief instructions for making observations in all parts of the world; as also for collecting, preserving and sending over natural things.* He recommended that seeds should be well dried and bulbs and tubers packed in moss, cotton or sand. The roots of ferns should be kept in a shady place until the ship was ready to sail when each root was to be planted in a box of clay or loam together with moss. Plants which he described as "juicy, crass [of a] thick substance" such as euphorbias, aloes and prickly-pear were to be hung in the air from the roof of a ship's cabin to prevent them from rotting.

About the same time that Woodward published his *Brief instructions* John Evelyn requested his friend Samuel Pepys, then Secretary of the Admiralty Board, to arrange for plants to be brought back in one of His Majesty's ships sailing from New England. Evelyn was very specific in his instructions for their

care. Seeds were to be adequately packed in paper, nuts in barrels of dry sand and trees, preferably small specimens, placed in small barrels with their roots wrapped in moss. He added that some people advocated coating roots with honey and then covering them with moss in the belief that "the honey has a styptic quality to hinder the moisting that is in the plants from perspiring. But if they are to come by a short journey of eight days or thereabouts honey would not then be necessary and covering them with mosse a little would suffice..." (Lemmon, p.7).

James Petiver, a London apothecary, printed a broadsheet for the guidance of his many correspondents in the West Indies and North America: *Brief directions for the easie making and preserving collections of all natural curiosities for James Petiver Fellow of the Royal Society London.* He assured his collectors that "all Seeds and dry Fruit, as Nutts, Pods, Heads, Husks, etc. these need no other care, but to be sent whole".

Especially during the eighteenth century all manner of processes and techniques connected with the traffic in plants and seeds were investigated, adopted or rejected but before we consider some of them I would like to refer briefly to some of the difficulties endured by the North American plant collector in getting his specimens in a viable state to the coast for shipment to Europe.

Well-known American collectors such as John Clayton, Mark Catesby, and John and William Bartram often worked in relatively unexplored territory with poor or no roads and always at risk from the unpredictable Indians. These collectors were employed by enthusiastic amateur botanists and gardeners in England such as Bishop Compton, Peter Collinson, John Fothergill and John Ellis, all citizens of London. It has been said that the enduring relationship between Collinson and John Bartram, extending over some 40 years, was the means whereby the botanic and other gardens of Europe were enriched by some 200 species of the flora of eastern North America. Bartram sent his first shipment of plants and seeds to Collinson in 1734 and soon afterwards Lord Petre in Essex and Philip Miller at the Chelsea Physic Garden became customers. By the time of Collinson's death in 1768 Bartram had nearly 60 subscribers. *The Gentleman's Magazine* for February 1754 announced "A list of Seeds of Forest Trees and flowering Shrubs gathered in Pensilvania, the Jerseys and New York, by John and William Bartram, and sent over the last year to their correspondents, being the largest collection that has ever before been imported into this Kingdom". In July 1756 Peter Collinson wrote from the snug security of his London home to John Bartram near Philadelphia: "It gives me pleasure to hear my old friend is well. I hope he will not expose himself to Indian cruelties, and yet I want a dozen boxes of seeds". John Lawson who collected for the Englishman, James Petiver, was horribly tortured and then burnt alive by Indians. His friend, Mark Catesby, established remarkably amicable relations with the natives who not only obligingly carried his box of specimens but at the approach of rain would immediately set about erecting a bark hut to protect him and his collections. David Douglas, another well-known collector, was treated with cautious respect by some Indians who thought his botanizing the act of a madman.

In a paper he read to the Horticultural Society of London in 1822, John Lindley deplored the still prevalent notion that all a plant collector had to do was "to tear a plant from its native soil, to plant it in fresh earth, to fasten it in a wooden case and put it on board a vessel". Such crude and unscientific

behaviour would not have been tolerated by the eminent Sir Joseph Banks who meticulously instructed Archibald Menzies in his collecting duties on board Captain Vancouver's *Discovery*. The seeds Menzies collected were to be carefully stored in paper packages which were to carry "such particulars relative to the Soil and Climate, where each was found and the mode of culture most likely to succeed with it".

After plants had been collected there remained the constant problem of keeping them alive. Richard Spruce who was collecting Cinchona plants in the Andes in 1859/60 discovered that the only way he could prevent his plants from withering in the hot sun was to water them constantly but then, he said, "there was the risk of their damping off... In a few weeks the cuttings began to root and then they were attacked by caterpillars" (Gorer, p.28). Peter Collinson wrote to John Bartram in February 1736 recommending ox bladders for keeping plants fresh for three or four days. These bladders were to be cut off at the neck and filled with water (Darlington, p. 87). Seeds, bulbs and roots were usually stuffed into saddle bags and leather pouches.

American collectors often maintained a garden, nursery or plant depot (as they were sometimes called) for growing their plants until they were wanted or were healthy enough for despatch across the Atlantic. Collinson told John Bartram in January 1735 to put a collection of laurels and honeysuckles in a box with holes in the base. Then, said Collinson, "let this box stand in a proper place in thy garden, for two or three years, till the plants have taken good root, and made good shoots" (Darlington, p.64). The French collector, André Michaux, had plant depots in Charleston and New York. Visitors to his depots who had expected some sort of botanical garden found no decorative display and complained of the "ill taste and judgement of this Botanical Frenchman" (Cutler, p.291). There was also a garden in Halifax, Nova Scotia which served as a nursery for plants intended for George III's royal gardens at Kew. The nurseryman Landreth of Philadelphia looked after John Lyon's collections until he wanted to ship them to England.

But bringing plants and seeds safely to a port for shipment was child's play compared with all the hazards that attended their subsequent sea voyage. Bureaucratic Customs officials or storms at sea could delay the departure of ships while their precious cargoes of plants wilted or rotted quietly away. Thomas Jefferson writing from Philadelphia on 2 December 1792 to his French correspondent, Stephen Cathalan, lamented that "great injury and loss happen in shipping and unshipping in warehouses, etc" (Betts, p.181). He strongly advised him to send his plants to Charleston or if that were not possible to New York or Philadelphia. Baltimore and Norfolk were strictly to be avoided, presumably because of their poor docking facilities. These delays at the ports together with the likelihood of a voyage of a few weeks extending into several months if the ship were becalmed at sea, prompted Jefferson to ask his friends to send him seeds rather than plants.

No ship was safe from the pirates or buccaneers who infested the waters of the Caribbean. William Sherard in London was very distressed on learning that plants sent to him by Mark Catesby in 1723 had been lost when the ship was plundered by pirates.

When ships were intercepted by such marauders or in times of war the plants were usually the first part of the cargo to be jettisoned before any naval engagement. In just one month alone in 1757 during Anglo-French hostilities

19 of the 21 ships that set sail from Charleston for England were captured by the French. Alexander Garden who was a physician in Charleston wrote a consoling letter on 6 July 1757 to his friend John Ellis in England. "A few days ago I heard that both Captain Coats and Cheesman were taken, and with them the two most valuable collections of seeds that ever I could promise or even hope to procure for you" (Smith, p.411). However Ellis was able to report later that some of the Garden's consignments had been delivered to a French botanist who most commendably promised to forward them when times permitted. So often were consignments lost in this way that John Bartram eventually took the precaution of adding the name of the French botanist, Bernard de Jussieu, to his English plant shipments so that should they be captured by the French then at least French botanists and gardeners would have the benefit of them.

Many ships' captains were understandably reluctant to have cases and tubs of plants not only cluttering their decks but also requiring some attention from the crew to keep them alive. One captain refused point-blank to take on board a consignment of plants from India because an ex-Governor was one of his passengers and he "could not think of disgracing him with such incumbrances" (Hove). Captain Vancouver objected to the glass frame built on the quarter deck of his ship, the *Discovery*, to house the plants the surgeon-botanist, Archibald Menzies, collected on the voyage. His resentment eventually manifested itself in the spiteful act of putting Menzies under arrest when the unfortunate man protested against being denied the services of his personal servant who was then not able to attend to the plants which were, so he later informed Sir Joseph Banks, now reduced to "dead stumps" (Dawson, p.607).

The crew equally unenthusiastic about this unnautical task of looking after plants, frequently left them unprotected on the deck during storms or neglected to see that they got adequate water and light. Their indifference probably contributed significantly to the high rate of casualties in plant shipments. On the other hand their interest or curiosity could have equally disastrous results. Peter Collinson was understandably annoyed that sailors were stealing some of his plants, believing they were rarities, to give to their friends (Darlington, p.182). And a certain Thomas Manning trying hard to look after plants destined for China complained to Sir Joseph Banks that the ships' officers were plucking them for buttonholes (Dawson, p.576).

By now I am sure you will have got the message that the transportation of plants by sea was not without problems; and it was also expensive. John Livingstone, an East Indian Company surgeon stationed at Macao in the early years of the nineteenth century, calculated that since about a thousand plants were lost for every one that survived, it must cost about £300 to bring just one plant from China to England in a healthy state. John Reeves who was a tea inspector for the East India Company at Canton and Macao was highly successful in persuading the captains of the East Indiamen to take a personal interest in the plants in their charge. Some captains and ships' surgeons became quite devoted to this trade in natural history materials; a few even brought back their own collections. But the accolade for horticultural devotion must surely go to Captain Edward Cumming of the *Britannia* who [in 1789] thoughtfully lit a fire in his cabin to keep the frost away from some guinea grass (or millet) in his care.

Both Reeves and Livingstone believed it was essential to get plants well rooted, preferably in pots, before despatching them. Similar advice was prof-

ferred by John Fothergill to Humphry Marshall in Pennsylvannia in 1767: "if thou meets with any curious plant or shrub transplant it at a proper time into thy garden; let it grow there a year or two; it may then be taken up in the autumn," (Corner and Booth).

Bulbs and tubers presented no difficulties. John Fothergill assured Humphry Marshall that "bulbous roots of all kinds are easily conveyed ... Wrap them in papers, keep them from vermin, and put them up with other plants or in a little dry box by themselves" (Corner and Booth, p.397).

The choice of season was considered crucial for the health of plants in transit. Experience had convinced Mark Catesby who collected in Virginia, Carolina and Florida that October or winter was the best time for sending plants to Europe (Bradley, p.58). Peter Collinson explained to his friend John Custis in Williamsburg, Virginia "that plants going in the Spring, some come into the Warm Latitudes which setts them a growing, and for the want of water, and a little Tendance they are soone lost" (Swen. p.51). Philip Miller in his great *Gardeners Dictionary* (7th ed., 1759) asserted confidently that spring was the best time to send plants from a hot climate to a cold one in order to allow them to recover before the onset of winter; and plants leaving a cold climate for a hotter one were to be despatched in the winter.

By the end of the eighteenth century an impressive corpus of experience had accrued on the most efficacious means of transporting plants. Some of it inevitably conflicted. A few practices seem to derive from intuition and a naive trust in Providence; other methods rested uneasily on pseudo-scientific foundations. But nearly all involved the liberal use of sphagnum moss.

Roots were usually carefully wrapped in moss. Fothergill believed that vegetating seeds could be packed in layers of slightly damp moss and he praised William Young of Virginia for wrapping his plants so securely in moss: "They come thus very safe and we lose very few of them", he said (Darlington, p.504). An article in Loudon's *Gardener's Magazine* for 1831 comments on the physical condition of a consignment of plants received in America from European nurseries. Apples, pears, grapes and roses packed in moss were healthy; other plants with only straw around them were in a wretched state (Buel, p.441-42). According to some authorities the amount of moisture in the moss was the important factor. As recently as the 1930s one plantsman of Idaho used to put his wet moss through the household mangle in order to achieve the right degree of dampness.

We now reach the stage where the plants, with or without moss, are ready to be stowed on board ship. And most sailing ships were alive with predators just waiting for a meal of succulent plants or to make snug little homes in them. Many a family of sea-faring rats was brought up in the soil of plant boxes, and I doubt whether Peter Collinson was moved by any paternal feelings on the occasion he discovered a cosy nest of baby pink rats in a wreck of roots. John Fothergill sadistically suggested mixing broken glass in the earth to deter rodents from burrowing into it. Sir Joseph Banks who never did anything in a small way proposed smoking and the beating of drums to drive them out of the ship. Occasionally a sympathetic captain might be persuaded to suspend choice plants in a basket well out of the reach of roving rats. Another pest, cockroaches, were to be enticed to their death with pans of water generously laced with arsenic but, cautioned Sir Joseph Banks, "the crew must not complain if some of them who may die in the ceiling make an unpleasant smell". If Sir Joseph could

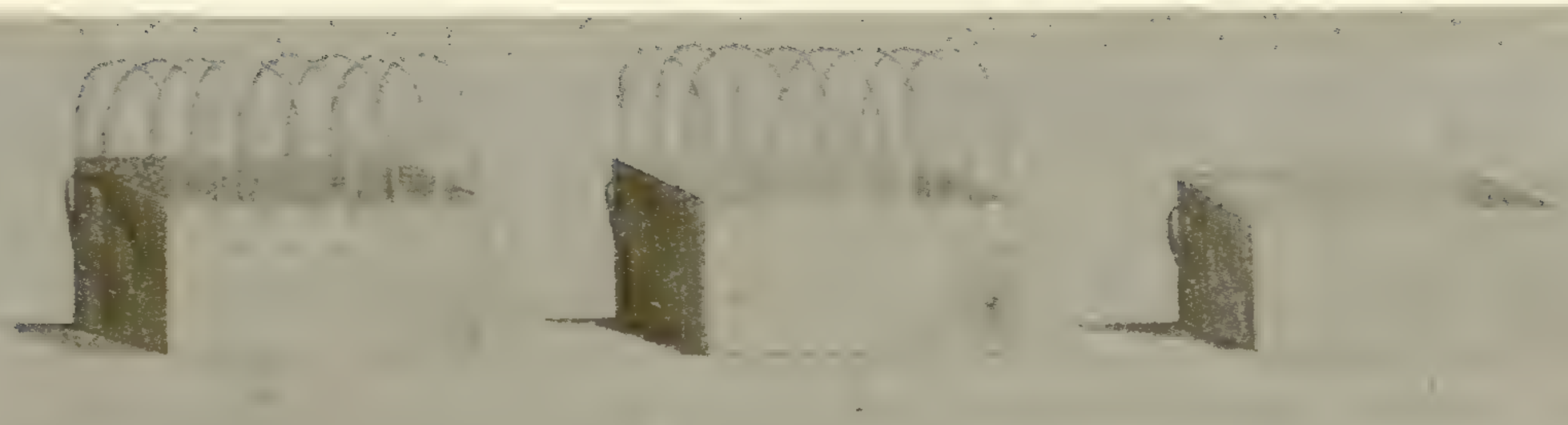
have had his autocratic way – and he often did – all livestock would have been banned as well. Monkeys, goats, dogs and cats were especially unwelcome. "Dogs" he asserted, "are troublesome as the fresh earth attracts them, and tempts them to scratch in it, and cats from the habit they have of burying their excrement [in it]" (Dawson ed. The Banks letters). Laths were often nailed across boxes to protect their contents from feline claws.

I have already mentioned that over the years there gradually evolved a code of practice for the shipment of plants. The principal guidelines were as follows:

1. Weak and sickly plants were to be rejected; selected plants should have well established roots before being put on board ship. J.C. Lettsom advised that plants no more than a foot tall should be collected since young plants "bear removing much better than old ones".
2. Great care was to be taken regarding the soil chosen for potting the plants; clay which retains moisture and could rot them was not recommend. It was, incidentally, common practice to sprinkle seeds in the soil of plant boxes in the hope they might germinate during the voyage.
3. Plants should be housed in small boxes and chests, ideally no more than about 3 feet long by 18 inches wide and 16 inches deep, so that they could be easily moved in bad weather.
4. Salt spray which was very harmful to plants was to be sponged off immediately with fresh water. The poop, being the highest part of the ship and therefore farthest from the sea spray, was considered the best location for plant boxes.
5. The poop was also favoured for the maximum amount of sun and light it provided. Plants were to be given as much fresh air as possible except in stormy weather when they were to be covered with tarpaulins.
6. Plants were to be watered regularly but care was to be taken not to overwater them. (It would appear that plants destined for the royal gardens at Kew and Windsor got preferential treatment. Concerning one particular voyage to Australia in 1789, Sir Joseph Banks gave instructions that "if any other plants except those intended for the King be taken on board no water shall be issued for them until the King's plants shall have their full allowance.")

Heating, rotting and over-drying were considered to be the principal causes of plant mortality. The ship's hold, lacking light and fresh air, was rejected as a suitable store for plants. The captain's cabin, on the other hand, was ideal and close to the stern windows which could be opened whenever the weather permitted. The space beneath his bunk was also coveted for very special plants. A contented Collinson wrote to Bartram in January 1735: "Thee canst not think how well the little case of plants came, being put under the captain's bed, and saw not the light till I went for it; but then, Captain Wright had a very quick passage" (Darlington, p.64).

About 1770 John Lettsom formulated some *Directions for taking up plants and shrubs, and conveying them by sea* for his friend, John Fothergill. This broadsheet reads like an affirmation of faith. The first tenet or commandment insisted that "each ship should be furnished with a Mattock and a Spade".



DIRECTIONS *for taking up* PLANTS *and* SHRUBS, *and Conveying Them by* SEA.

IN Order to take up the Plants advantageouſly, each Ship ſhould be furniſhed with a Mattock and a Spade, with the Mattock a ſmall Trench ſhould be opened round the Plant intended to be taken up, the Spade ſhould then be put under the Root, which muſt be lifted up with a very large Ball of Earth ſurrounding it, the Ball may afterward be pared carefully with a Knife, and reduced as ſmall as can be done without wounding any of the larger Roots.

Of each Kind the youngeſt Plants of Shrubs and Trees that can be found ſhould be taken; none of them ſhould be above a Foot high, as young Plants are found by Experience to bear removing much better than old ones.

The moſt convenient kind of Boxes for the Conveyance of Plants in long Voyages are made about Four Feet long, Two broad, and Two deep, theſe, when half filled with Earth, can be conveniently carried by two Men holding the Rope Handles fixed to their Ends.

There ſhould be laid about half full of Mould, with a few rotten Sticks or Leaves at the bottom, and the Plants intended to be ſent, planted in it, as ſoon after the Ship's Arrival as poſſible. When the Ship is about to ſail, and they are ſent on board, Hoops are to be nailed to the Sides of the Box in ſuch a Manner, that, arching over it, they may cover the Heads of the Plants, ſmall Ropes are to be twiſted between theſe in the Form of a Net to prevent the Dogs or Cats from getting at them, and ſcratching them up, on Account of the rich Mould.

For each Box ſo hooped and netted, provide a Canvas Cover, which may when put on entirely protect it, and to prevent this Cover from being loſt or miſlaid, nail it to one Side, and ſix Loops or Hooks to the other, by which it may occaſionally be fattened down.

The Captain who takes Charge of them, muſt be particularly informed that the chief Danger Plants are liable to in long Voyages is occaſioned by the minute Particles of Salt Water with which the Air is charged, whenever the Waves have white frothy Curls upon them; theſe Particles fall upon the Plants, and, quickly evaporating, leave the Salt behind, which choaking up the Pores prevents Perſpiration, and conſequently kills the Plant. He therefore ſhould never let the Covers be off, except on Days when the Wind is not conſiderably high, to beat the Water up into what the Seamen call White Caps, he muſt not keep them ſhut up during the Voyages for it be ſhut they will mould and periſh by the ſtagnation of the Air under the Covers, and if at any Time, by Accident or Neceſſity, they ſhould have been expoſed to the Wind, when the Waves have White Caps, he muſt be directed to water them well with freſh Water, ſprinkling all the Leaves with it, to waſh off the ſalt Drops which cover them. In this Manner Plants may be brought from almoſt any Diſtance, many come from *China* every Year in a flouriſhing State.

It is a Convenient to the Captain to give up a ſmall Part of the Great Cabbin to the Plants, as it certainly by far the beſt Station for them, not are they much in the Way, as the Place where only them beſt is ſhould be to the Stern Windows in the Cabbin they muſt not be touched with their Canvas Covers, and they may frequently have Air, by opening the Windows when the Weather is quite moderate.

Ripe Seeds of all Kinds ſhould alſo be brought Home, and it will be proper to ſow them in the Boxes of Earth, between the growing Plants, as many Sorts of ſeeds may be procured which may have miſcarried in Caſe of Failure of the Plants.

And if any ſmall Bits of broken Glaſs are mixed with the Earth, on the upper Surface of the Boxes, it may prevent Mice or Rats from burrowing in the Earth, and deſtroying the tender Roots of the Plants and growing Seeds.

Fig. 1. Repreſents the Form of the Box.
—— 2. The ſame, with Hoops and Loops, *a---a* for ſecuring the Canvas.
—— 3. The ſame, netted.

John Fothergill's brief instructions for the care of plants during their transportation. This leaflet was issued to his plant collectors and ships' captains. c. 1770.

By the opening years of the nineteenth century a plant cabin or greenhouse was a familiar sight on the poop of a ship but it was generally used on routes longer than those between Europe and North America. These plant cabins which could be as large as 14 ft long, 12 ft wide and 5 ft high and with their contents could weigh several tons, were viewed with alarm by the crew who quite naturally feared they would upset the balance of the ship. Writing to Sir Joseph Banks (who approved of them), a gardener on board a ship bound for China in 1806 peevishly complained that "the first mate does not approve of having a garden on the poop at all. He says it wracks the ship all to pieces. The captain agrees in the same story and when the beams creak in the cuddy [i.e. the cabin] they all turn to me sometimes and damn the flower pots" (Dawson, p.576).

By the late 18th century it was not unusual for large and valuable consignments of plants on long voyages to be accompanied by a gardener to look after them. St Helena in the South Atlantic was a convenient convalescent home for sickly plants which were left there to recover and collected a year or two later.

Because of the difficulties in keeping plants alive seeds were often preferred. By the middle of the eighteenth century there was a very flourishing trade in American seeds. John Bartram moaned to Peter Collinson in June 1756 that "when I go to gather seeds where I used to find them, the people near where they grow will not let me have them; but tell me they will gather all to send to London (Darlington, p.210). Bartram found he could not satisfy the insatiable demand from the other side of the Atlantic. "Do they think I can make new ones?", he asked Peter Collinson in August 1761. "I have sent them seeds of almost every tree and shrub from Nova Scotia to Carolina; very few are wanting; and from the sea across the continent to the Lakes ... if I die a martyr to Botany, God's will be done" (Darlington, p.232).

The traffic in seeds was not all one way. Bartram, for instance, often received presents of seeds from his correspondents in England. And Peter Collinson sent seeds of melons and other plants he had received from the Botanic Garden at Petersburg in Russia to John Custis in America.

As with plants there evolved a number of rules for the collection and despatch of seeds:

1. Seeds should be ripe, gathered in dry weather, and well dried before packaging.
2. Damp and a humid atmosphere which would encourage mildew were to be avoided. Suspending seeds in a bag from the ceiling of a cabin was considered to present the best conditions for their storage. (One begins to feel sorry for the long-suffering crew with boxes of plants stuffed beneath their bunks and swaying bags of seeds dangling above their heads).
3. Insect infestation had to be carefully watched and controlled.

Robert Fortune, a plant collector in the Far East, carried out an experiment in 1843. He sent a consignment of seeds to China packed in three different ways:

1. in sealed bottles;
2. packed in paper and stored in a box lined with tin;
3. in a canvas bag hung up in his cabin.

The seeds in the tin-lined box and the canvas bag survived the journey in a healthy state but many of the seeds in the sealed bottles had become mouldy and failed to germinate. Nevertheless he still thought this method could be satisfactory provided the air in the bottles and also the seeds themselves were perfectly dry.

There is not sufficient time to consider all the methods that were tried to prolong the viability of seeds. The Professor of Botany at Cambridge, Richard Bradley, was convinced "that tis the best way to gather the Seeds in their Shells and Cases, and so to bring them to us; for besides the help such cases will be to preserve the Seeds during the Voyage, they will help to inform us of what Class or Order the Plants are of which they were taken from"(Bradley, p.59). Philip Miller's *Gardeners Dictionary* was in agreement: "It is the safest way to bring all sorts of Seeds in their Pods or Husks, in which they grew, provided they are put up dry; because their own covering will afford them some nourishment if the seeds are not separated from the Placenta". Richard Bradley also recommended that the pulp surrounding stone-fruits should be retained but James Lee, a nurseryman at Hammersmith in London believed that the seeds of plums and peaches would keep best if the pulp were removed.

The Swedish naturalist, Linnaeus, informed John Ellis in 1758 that seeds should be put into a cylindrical glass bottle, filled with dry sand, then corked, and a bladder tied over its mouth. This in turn was to be placed into a larger glass vessel and a mixture of nitre, salt and sal amoniac packed into the intervening space between the two glass containers to provide insulation against external heat. Bradley in the 1720s had advocated a similar method but the experience of Philip Miller of the Chelsea Physic Garden was that seeds so sealed in bottles and deprived of fresh air would not germinate. He believed they retained their vegetative power much longer if tied up in cotton or linen bags.

Governor Ellis of Georgia in his correspondence with John Ellis advanced the opinion that seeds should be housed in tight casks, and placed on or near the deck so as to have the benefit of the fresh air but at the same time the tightness of the cask would protect them from the salt spray.

Alexander Garden of Charleston sent Ellis seeds "packed in good dry soupy mould" (Smith, p.360).

It was soon discovered that some seeds quickly lost their viability. Miller's *Gardeners Dictionary* cautions that Magnolia seeds "should be put in sand and sent over to England as soon as possible, for if they are kept long out of the ground they very rarely grow".

Lee of Hammersmith instructed his collectors to pack oakum or rope fibre around the seeds to discourage insects. Camphor was also used as an insect repellent. Nathaniel Wallich, Superintendent of the Royal Botanic Gardens, Calcutta, protected his seeds from insects by packing them in paper impregnated with arsenic and then putting them into containers with coarse brown sugar. John Sneyd of Belmont in Staffordshire indulged in similar culinary practices; he too was addicted to using brown sugar. He became also a devotee of raisins having accidentaly discovered that some seeds kept rather well in a consignment of these currants. Charcoal was used by Dr. Thwaites of the Botanic Gardens at Peradenia in Ceylon to counteract fungi.

J.C. Lettsom informed the reader of his *Natural history of the tea-tree* (1799, 56) that "another method has succeeded with some North American seeds, by putting them into a box, not made too close, upon alternate layers of moss, in such a manner as to admit the seeds to vegetate, or shoot their small tendrils into the moss". Fothergill instructed William Bartram to send his larger seeds between layers of dry moss. And John Ellis was so convinced of the effectiveness of dried moss that he urged all plant collectors never to be without a sack or two of it.

At this point you may well be thinking "Why not just plant the seeds in boxes of earth and let them germinate on the voyage?" This method was indeed proposed by Lettsom for bringing seeds from China but then there arose the problem of looking after the tender seedlings.

I have already mentioned boxes, casks and bags as receptacles for seeds but more exotic containers were sometimes employed. Mark Catesby successfully sent his Virginian seeds in the shells of gourds. Ellis received seeds from China "in most excellent order" in tortoiseshell and horn snuff boxes. And some trusting souls simply sent small quantities of seeds in ordinary letter-packets through the regular post.

For John Ellis the investigation of the means of transporting plants and seeds was an all-consuming passion. A friend of Peter Collinson and John Fothergill, he was a London merchant and also agent for West Florida and Dominica. His life's work all began in 1757 when he sent some acorns in sand to North America and they died. Not deterred he got more acorns, coated some with gum arabic, others with bees-wax, or rosin, or a mixture of pitch, rosin and bees-wax — the permutation of substances becomes quite confusing — and sent them to Governor Ellis in Georgia in 1759. Only the seeds covered in wax and coated in brewers loam moistened with a thick solution of gum arabic survived. Next he carried out similar experiments with Spanish chestnuts immersing them in mutton fat, or bees-wax and mutton, or bees-wax by itself or bees-wax and yellow rosin. The results were inconclusive. One has to admire his pertinacity. Not in the slightest dismayed he persevered with his investigation with Dr. Garden in Charleston as one of his long-suffering collaborators. He sent magnolia seeds packed in bees-wax and tallow, in tallow by itself, in myrtle wax and also in a very strong solution of gum arabic. In December 1760, at the earnest request of the Society for the Encouragement of Art, Science and Commerce in London he sent tea seeds embedded in balls of wax to the Governors and principal botanists in North America. Benjamin Franklin representing the Northern Provinces was sent 5 balls, Dr. Garden 2 balls for South Carolina, North Carolina and Georgia got one ball each and the botanists Pickering Robinson, John Clayton, John Bartram and Cadwallader Colden each got one ball. Unfortunately the ship in which they were despatched was intercepted by the French navy and the balls of tea never did reach their destination. But this setback did not even dent Ellis's resilience. In 1768 he writes an enthusiastic letter to the Royal Society about his success in preserving acorns for an entire year without planting them. He concludes that his experiments "may in a few years put us in possession of the most rare and valuable seeds in a vegetating state from the remotest parts of the world, which in time may answer the great end of the improvement and advancement of our trade with our American colonies" (Ellis, p.78). In 1770 he published *Directions for bringing over seeds and plants, from the East-Indies and other distant countries, in a state of vegetation: together with a catalogue of such foreign plants as are worthy of being encouraged in our American colonies.*

Various containers used for transporting plants or seeds. From John Ellis's *Directions for bringing over seeds and plants, from the East-Indies and other distant countries in a state of vegetation* . . . London, 1770.

This and his *Directions for captains of ships, sea-surgeons and other curious persons who collect seeds and plants in distant countries* reflect his implicit faith in his wax coating experiments.

J.C. Lettsom in his *Hortus Uptonensis* (1783) also recommended embedding seeds in yellow bees-wax. But in his *Naturalists' and travellers' companion* (ed. 3, 1799) he writes rather dismissively that American seeds are "usually wrapped in common brown paper".

Ellis's role as a pioneer in the waxing of seeds was disputed in 1759 by Samuel Pullein in his slim pamphlet, entitled *An essy towards a method of preserving the seeds of plants in a state fit for vegetation, during long voyages. For the improvement of the British colonies in America.* He claimed that he had already been conducting experiments on preserving seeds in tallow and resinous gums while Ellis was still trying to keep them alive in clay or sand.

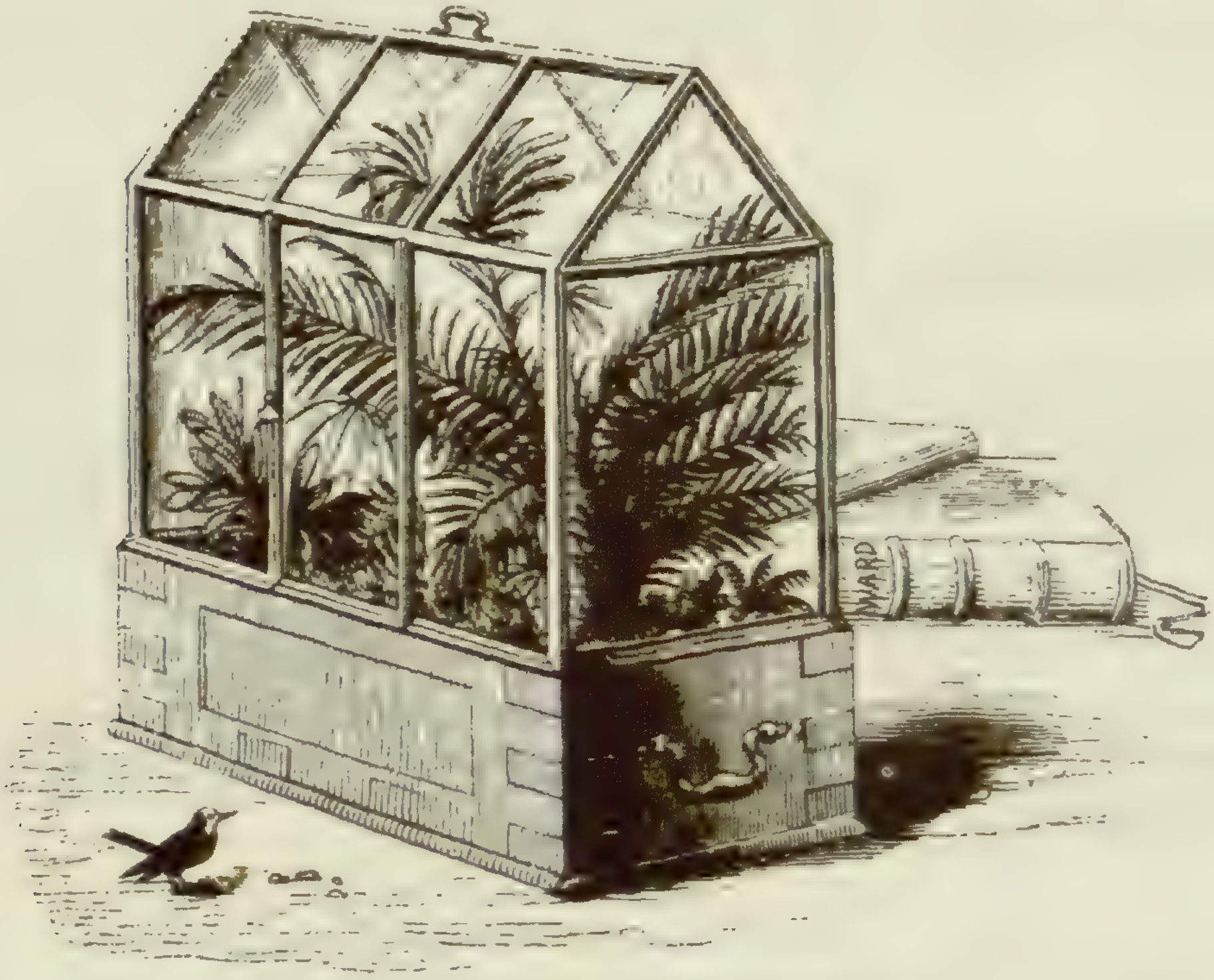
It seems that tempers often became frayed whenever seeds were involved. It was an irritable John Custis who complained to Peter Collinson in July 1736: "I know not how it happens; but the seeds in generall wee have from England very often never come up; I believe it is often the faults of the seeds men" (Swem, p.50) he concluded. The following year we find Collinson berating John Bartram for not packing his consignment of seeds as compactly as possible resulting in higher freight charges for Collinson. "Had thee a thought on this, thee would have packed such things closer" (Darlington, pp.96-97). Collinson struck another discordant note a few years later when he remonstrated about the variable quality of the seeds in a particular consignment that had subsequently given him a lot of trouble in sorting out for his friends. Much aggrieved,

Illustration of a plant container from John Ellis's *A description of the mangostan and the bread fruit . . . to which are added directions to voyagers, for bringing over these and other vegetable productions, which would be extremely beneficial to the inhabitants of our West Indian Islands.* London, 1775.

John Bartram rebuked him: "I reflected what pains I had taken to collect those seeds in several hundreds of miles of travel, drying, packing, boxing and shipping, and all to put my friend to trouble! Indeed, my good friend if thee was not a widower, I should be inclined to tell thee that old age had advanced upon thee as upon myself!" (Darlington, p.215). John Fothergill complained to Bartram about his compatriot, William Young, who "has been very diligent but has glutted the market with many common things ... But, contrary to my opinion, he put them into the hands of a person who, to make the most of them, bought up, I am told, all the old American seeds that were in the hands of the seedsmen here, and mixed them with a few of W.Young's, to increase the quantity. Being old and effete, they did not come; and have thereby injured his reputation".

The opening years of the nineteenth century saw a move from bags, bottles and chemical preparations to planting seeds in boxes with glass tops. The enterprising John Livingstone was experimenting with drying seeds artificially in a Professor Leslie's 'Ice Machine'.

On long voyages plants were now often housed in tightly sealed boxes with a glass roof. In 1835 the ship *Hibernia* brought some plants in remarkably good condition from Calcutta in such a container which was never opened and the plants never watered during the whole of the five months' voyage. This presumably was an early use of the Wardian case, invented by Dr Nathaniel Ward, who first tried it out in 1833 with a batch of plants despatched to Sydney in Australia. He had discovered that provided there is sufficient light to allow photosynthesis, the transpiration of the plants saturates the air within the case with water vapour which in turn condenses on the glass and moistens the soil in a continuing cycle. The American botanist, Asa Gray, in his obituary of Ward in 1869 recalled seeing the first Wardian case of plants sent to New York in 1834 "as fresh and healthy as when they left London".



A Wardian case. As illustrated in N.B. Ward's *On the growth of plants in closely glazed cases.* 2nd ed. London, 1852.

Plants being put into a Wardian case at the Royal Botanic Gardens, Kew. Such a case was in regular use before World War II.

The large and important nursery firm of Loddiges in Hackney, London was soon making regular use of Wardian cases. Conrad Loddiges told Sir William Hooker, Director of Kew Gardens that "whereas I used formerly to lose nineteen out of the twenty of the plants I imported during the voyage, nineteen out of the twenty is now the average of those that survive". And from Sir William Hooker Nathaniel Ward learnt that his cases "have been the means, in the last fifteen years [1836-51], of introducing more new and valuable plants to our gardens than were imported during the preceding century", The Wardian case remained the conventional means of transporting plants until it was superseded by air transport.

Of course the migration of plants has not always been deliberately planned and controlled. Seeds, for instance, have been dispersed over great distances by

natural means: by winds, sea currents and birds. And they have often accidentally been included in cargo. Peter Collinson and John Fothergill would always carefully scatter in their gardens all the earth from the boxes in which the plants they had received from North America had been growing and sometimes they would be rewarded with new plants from seeds fortuitously dormant in the earth. John Ellis successfully raised a tea-plant from a solitary seed he spotted by chance in the bottom of a tin canister from China.

There is, or used to be, a notice in the grounds of Vancouver Barracks, Washington proclaiming "The oldest apple tree in the Northwest grown from seeds brought from London, England, planted in 1825 by the Hudson's Bay Co". It would appear that during a farewell party in London in 1825 for some men about to join the Hudson Bay Company, some ladies playfully slipped a few pips from apples eaten at the meal into these young men's waistcoat pockets. When they got to Fort Vancouver they found the seeds which they very sensibly planted and the apple trees subsequently flourished. Those apple pips had not been protected in a bag or bottle or special container nor covered with wax or rosin but nevertheless they had survived in the casual comfort of a coat pocket. They illustrate the final point I would like to make in this paper: that notwithstanding all the novel and sophisticated methods employed to transport plants and seeds the element of luck always remained an essential ingredient.

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Traduction de Céline Arsenault, Jardin botanique de Montréal.

LOUIS HÉBERT – Apothecary and colonist (1575-1627)

This stamp was issued to commemorate the 45th International Congress of Pharmaceutical Sciences of the International Pharmaceutical Federation held in Montreal in September, 1985. Clermont Malenfant, a graphic artist from Montreal, designed the stamp. It depicts Louis Hébert with a branch of balsam fir (*Abies balsamea* (L.)Mill.), and silverweed (*Potentilla anserina* L.), the mortar and pestle to symbolize the science of pharmacy and the scythe and wheat to stress his agricultural interests.

Louis Hébert was born in Paris, France in 1575, the son of an apothecary. He went three times to the New World; initially, from 1604 to 1607, Hébert practised as an apothecary in Port Royal (Annapolis Royal, Nova Scotia); he returned to the Colonies four years later, in 1610. But when the British took over the colony in 1613, he again went back to France. At the request of Samuel de Champlain he came back for a third time, accompanied by his wife and their three children, to settle in Quebec in 1617. The Compagnie des marchands was in charge of the trading post and Hébert was not allowed to practice farming on a full time basis since agriculture was considered a threat to the fur business. However, the employees of the trading post survived the winter thanks to the vegetable and grain crops Hébert had grown. A year later Champlain appointed Hébert magistrate of the colony. Hébert died in 1627 as the result of an accidental fall.

Besides this commemorative stamp there stands, as a lasting monument to this pioneer, a statue of Louis Hébert in Mont Morency park in Québec City.

Canada's First Pharmacy Stamp,
Issued 30 August 1985

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18th CENTURY CANADIAN GARDENING: 'GOOD GARDENS FULL OF GARDEN STUFF'?*

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Abstract

While gardening was a leisure activity for the social elites, most Canadians who gardened in the 18th century did so out of practical necessity. This paper traces gardening activity at Ile Sainte-Croix, Acadia and Louisbourg. Religious and secular gardens in New France and Quebec are examined, and the influence of the Loyalists and British officials at the end of the century is noted. Vegetables and fruits in great variety were the primary products in the newly settled land. Garden designs followed residential and institutional preferences of French, British and American homelands. A wide range of documentary and iconographic sources of the period, as well as their interpretation in preserved and reconstructed gardens, guide us in understanding the nature and extent of gardening activity in Canada in the 18th century.

Résumé

Activité de loisir pour les élites sociales, le jardinage demeurait au 18e siècle une nécessité pour la plupart des Canadiens. Cet article retrace la pratique du jardinage en Acadie, particulièrement à l'Ile Sainte-Croix et à Louisbourg. En visitant les jardins religieux et laïques du Québec et du reste de la Nouvelle-France, on note l'influence, à la fin du 18e siècle, des Loyalistes et des fonctionnaires britanniques. Les productions primaires des terres récemment colonisées comportaient une grande variété de légumes et de fruits. Quant à l'aménagement des jardins, il s'accordait aux préférences résidentielles et institutionnelles des patries d'origine des colons français, britanniques ou américains. De nombreuses sources documentaires et iconographiques, de même que leur interprétation à travers les jardins préservés et reconstruits, nous aident à comprendre la nature et l'étendue du jardinage au Canada au 18e siècle.

Introduction

"Gardening," wrote Montagu Wilmot in March 1764, a year after his appointment as lieutenant-governor of Nova Scotia, "is the chief amusement here."[1] Halifax was then 15 years old. Having been founded as a military strategy to offset the French fortress of Louisbourg on Cape Breton Island, it had settled back, after the Peace of Paris of 1763, into the lulls that characterized its existence between wars in the 18th century. Wilmot was addressing himself to Boston merchant Thomas Hancock, from whom he was ordering, for his first summer season in the Nova Scotian capital, a two-page list of "roots and

*This paper was presented at the symposium "To those faire plantations. 350 years of plant exchange between Britain and the New World", October 19, 1984, at the Royal Botanical Gardens, Hamilton, Ontario.

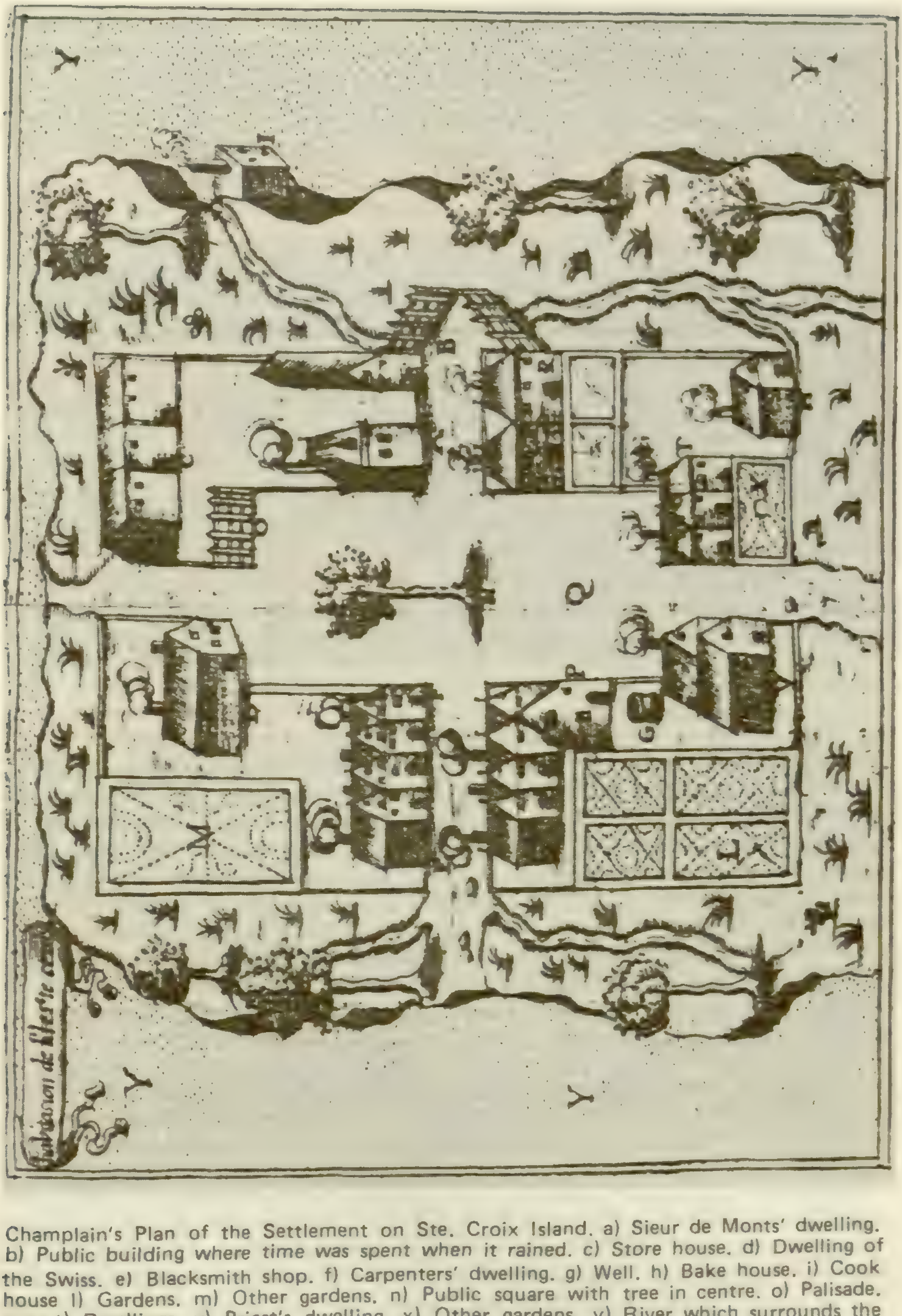
seeds." He urged Hancock to dispatch them "by the earliest opportunity," presumably so that he could plant hardy specimens as soon as the frost was out of the ground and perhaps more tender items in a hot bed. Unfortunately Wilmot's list is missing from the records, but two years earlier his predecessor, Chief Justice Jonathan Belcher, a Bostonian by birth, had received from the same Hancock a present of "Bulbous Roots, Rose & Dutch Honey Suckle" which, he had advised Hancock, "afford an Agreeable Ornament to my Garden."[2] Belcher, settled in Nova Scotia since 1754, was undoubtedly one of those who had made gardening such a popular activity among the Halifax officialdom. We do not know what Belcher's garden — nor those of Joseph Gerrish, naval storekeeper at the dockyard, and merchant John Grant — looked like. In June 1779, however, the Reverend Jacob Bailey, an Anglican minister recently arrived from the persecutions of the American Revolution in New England, described the garden of Richard Wenman, one of the original Halifax settlers and in 1776 one of the ten wealthiest property holders in the town, thus:

> We enter a spacious gate into a recent yard, with an avenue to the house bounded on each side by a little grove of English Hawthorne at this season in all their blooming glory —
>
> . . .[in the garden] were planted such a profusion of willows, hawthorns, fruit trees of various kinds that they formed a perfect wilderness, extremely pleasing to the sight and grateful to the smell and indeed...we rather fancied ourselves in the midst of a woody country than in the heart of a populous town.[3]

Gardening for the Halifax social elite of the late 18th century was a leisure activity. It undoubtedly enhanced their tables, but it was essentially a fashionable hobby. For the majority of those who gardened within Canada's territories in the 18th century, however, gardening was not primarily a leisure pursuit. Rather, it was a practical necessity designed, in the days before fulsome markets made produce readily available, to place fresh vegetables on the table, herbs in the soup, medicines in the cupboard, and dyes for clothing and textiles. Most settlers were recent immigrants — whether from France, Britain or the United States — who brought with them the gardening traditions of their homelands and undertook to replicate or adapt them in the "new founde land."

Ile Sainte-Croix

One of the earliest examples of this tradition is seen at Ile Sainte-Croix (now Dochet Island), the site chosen in 1604 by Samuel de Champlain for Pierre de Monts' French trading colony in Acadia. Champlain's map of the island settlement shows five separate gardens, each ornamented in the stylistic manner of the French renaissance parterre. Enclosed rectangles, subdivided internally by predominantly diagonal walks and focusing in most instances on a central feature, possibly a well or statue, they reflect contemporary design conventions and organizers' expectations. As Marc Lescarbot would later remark about the settlement, "before everything else, the cultivation of the land must be regarded."[4] And, indeed, gardens were planted immediately to provide for the winter, both on the island and on the upland banks on the mainland opposite, with seeds brought from France. On the island, however, topography rather than design established where the gardens would be situated — in a level area of fair soil just south of the middle of the island. Moreover, water, that most critical nutrient in gardening, was lacking, and the gardens planted on the island dried up. Rather than a record of the gardens actually established at Ile Sainte-Croix, in the colony's single year at this location, where nearly half the settlers died of



Champlain's Plan of the Settlement on Ste. Croix Island. a) Sieur de Monts' dwelling. b) Public building where time was spent when it rained. c) Store house. d) Dwelling of the Swiss. e) Blacksmith shop. f) Carpenters' dwelling. g) Well. h) Bake house. i) Cook house l) Gardens. m) Other gardens. n) Public square with tree in centre. o) Palisade. p,q,r,t) Dwellings. v) Priest's dwelling. x) Other gardens. y) River which surrounds the island.

scurvy during the winter, the map portrays a degree of site embellishment which it is most unlikely was actually achieved. Archaeological excavations support this interpretation.[5] Instead, with its forthright allusions to French renaissance traditions, the map portrays "more the ideal of what was intended to evolve as a habitation on St. Croix...rather than what was actually built...."[6]

Acadian Gardens

While the gardens at Ile Sainte-Croix were not full of good garden stuff, there are many evidences that, once the settlers moved to the west banks of the Bay of Fundy, at Annapolis and, as time passed, further north through Grand Pré and Minas to Chignecto and on to Shepody and Petitcodiac, the Acadians were successful in establishing solid agricultural settlements. The dykes they built on tidal marshlands to control the flow of salt water onto their lands are usually seen as their most distinctive agricultural accomplishment, and on these diked and reclaimed lands they raised a large part not only of their own subsistence but also of the stock, grain and produce they traded with Louisbourg and New England. Artifact findings in recent archaeological excavations have confirmed historical analyses that, as a result of their agricultural stability and their substantial trade, the Acadians maintained, on average, a considerably higher standard of living than previously believed. Gardens form part of this tradition.

Naomi Griffiths, historian of the Acadians, observes that "from the seventeenth century on travellers...noticed the variety and abundance of vegetable[s] grown" in Acadian communities, and she concludes that "the standard of living of the majority of the Acadians depended upon the produce of their landholdings" and that "at the very least a household would possess a garden."[7] One traveller about 1700 noted the prevalence of cabbages and turnips; another the cultivation of "cabbages, beets, onions, carrots, chives, shallots, turnips, parsnips and all sorts of salad greens."[8] Whether potatoes, that staple root crop of so many marginal settlements, were grown has been a question of considerable historical controversy which, with the evidence currently available, remains unresolved. A traveller near Grand Pré in 1757, remarking upon the abundance of fruit trees — apples, pears, cherries, plums — opined that "finer flavoured apples and greater variety, cannot in any other country be produced."[9] To use Graeme Wynn's words,[10] the Acadians recognized the "necessities of subsistence on an isolated frontier" and produced them.

Until very recently, while documentary evidence had shown the nature of Acadian gardening activity, there was no known physical evidence of Acadian gardens. In 1983, archaeological investigations at the Acadian settlement at Belleisle in the Annapolis Valley revealed that settlements were organized in clusters, with fields and marsh between them. At the one house excavated an enriched compacted soil adjoins the structure to the south, the most protected growing area. The finding, with what appears to be a cow path through its centre, has been interpreted as confirmation of the location of gardens indicated by fenced areas adjoining houses on period maps of the area.[11] Archaeology has been little used in the study of gardens in Canada, partly because of its expense and of the frequent uncertainty of its findings in the absence of historical documentation. British archaeologist Christopher Taylor has noted in discussing the application of his discipline to the study of gardens:

> There are problems of definition...Should small enclosed areas of land, adjacent to houses, be called gardens or could they be termed small

fields? And were such plots always used for growing plants or did they have other functions, notably as animal paddocks or farmyards? The problem of distinguishing garden plots from small fields [has been] almost impossible to solve. Theoretically fields are ploughed, gardens are not, and in addition fields are normally said to be given over to one main crop at any one time, while gardens have various crops. By the very nature of archaeological evidence it is often impossible to ascertain all or indeed any of these features...

As archaeological methods have become more sophisticated it is possible to recover evidence of plough marks cut into the subsoil or underlying rocks and so distinguish true fields from garden plots. It is also becoming possible to distinguish, in some cases, enclosures which may have been primarily for stock as opposed to cultivation. Palaeobotanical research can now identify the crops grown in fields and plots alike by means of techniques such as pollen analysis and seed identification, though this still cannot distinguish between fields and plots. In the main, however, we have to rely on less convincing ways of identifying gardens...that of physical shape and size as revealed by ground examination, air photography or excavation.[12]

In addition to the excavations at Belleisle, those at Louisbourg identified fence lines by means of fence post holes and provided seeds for botanical analysis. As these projects have demonstrated, archaeology is a valid tool for the study in Canada of gardens as well as of buildings and industrial remains.

Louisbourg

As Norman Newton has found in the case of gardens in colonial American prior to the Revolution,[13] virtually all 18th-century gardens in Canada were rectangular or square, with a basically geometric layout. This comes as no surprise given this traditional garden shape in Europe, dating back to the Middle Ages and, as Christopher Thacker points out,[14] incorporating Christian symbolism much older than that. There were, however, differences of location, size, design, planting, enclosure and gardening practice which distinguished them. The intensive research carried out in connection with the reconstruction of gardens at the Fortress of Louisbourg has revealed some of these distinctions there.

Founded in 1713 as a defensive work to protect French fishing interests in the North Atlantic and the entrance to the St. Lawrence River where France's North American colonies lay, Louisbourg was captured by New Englanders in 1745, returned to France, and recaptured in 1758 by the British, who destroyed it in order to prevent its subsequent renewal. In its brief half-century life, it was not only a military base but also a fishing port and in the 1740s a commercial centre of approximately 3,000 people, which carried on extensive trade with both Europe and New England. Unlike Acadia, it was never an agricultural colony, and it imported 500 pounds of flour per colonist each year, mostly from Canada.[15]

As an isolated settlement, Louisbourg had a chronic problem of self-sufficiency. As early as 1718, gardens were established to provide local produce. As at Halifax in 1750, where Governor Cornwallis' 1,500 acres of land "cleared and fenced in...[and] sowed with grass and planted with Potatoes and other Roots and garden stuff" lay outside the town's picket walls,[16] Louisbourg's largest gardens were situated at the edges of settlement. In addition, gardens

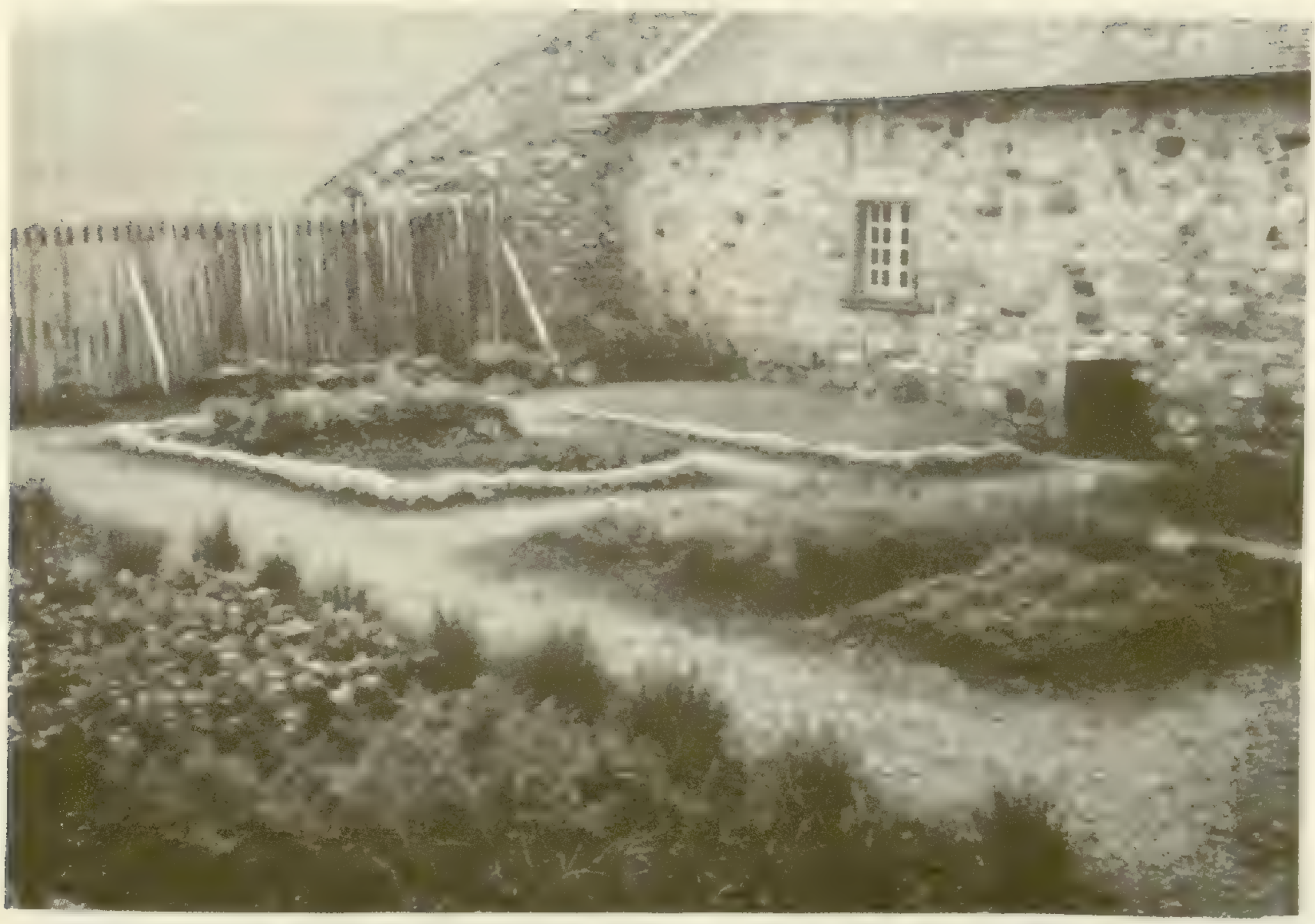
formed part of nearly every property both inside the walls and without. M than 100 gardens have been identified in records and on historical plans; in fa two plans show more than 80 gardens in the town area alone.[17] Most gard were located behind, sometimes also beside, the houses, which were built direc on the street front. As in urban centres elsewhere where grid layouts p dominated, lot size determined garden size at Louisbourg. Size data compiled from 60 maps, deeds, court records and estate inventories indicate that garden acreage varied widely. The largest was the Jardin du Roi, the King's Garden, 61.6 m x 43.6 m (2.69 km^2), where gardeners were employed growing vegetables for the settlement's officials. Measurements of the other 12 gardens whose dimensions are known averaged 19.9 m x 14.8 m or just over 295 m^2 each. The smallest was only 7.1 m x 5.2 m (37 m^2). The three other largest ones measured 32.5 m x 14.6m, 37.7 m x 9.7 m, and 29.2 m x 29.2 m.[18] The average of the remaining eight gardens was thus 17.5 m per side.

Although no regulations required the fencing in of gardens, virtually all gardens were enclosed, as fences were necessary to protect produce against all sorts of depredations including cattle in the streets. Christopher Moore's *Louisbourg Portraits*[19] gives a vivid portrayal of the rambunctious events in town life from which property owners would have wanted their lands enclosed. Despite the shortage of wood – which was soon consumed for building and fuel – and the prevalence of stone, pickets appear to have been generally used to surround the gardens – 1,100 were demanded, for example, to enclose the King's Garden in 1750. Pickets were commonly set 750-900 mm in the ground, with corner posts and bracing either in front or behind the posts. Boards were apparently widely used as well and shrubs and railings occasionally so.[20]

No detailed design for any single garden has been located to date, and evidence on the historical plans, as is typically the case, is inconsistent, sometimes even within the year. General features can, however, be identified that reflect the French design heritage of the settlement: square or rectangular plots of regular size, sometimes edged with greenery, and separated for practicality as well as a sense of order by cross-paths. The entry in Diderot's *Encyclopédie* (1751-72) suggests that Louisbourg gardens were quite typical of French layout, if not scale, of the age:

> Their ordinary arrangement, which is the best as well as the easiest for the gardener, is the one where the garden is arranged, as much as possible, in squares, with the length slightly longer than the width. The width of the paths must be in proportion to the length as well as the surface area of the garden. The smallest ones should be no less than from six to seven *pieds* (2 to 2.3 m) in walking space; and the biggest ones, regardless of their length, should never exceed three or four *toises* (6 or 8 m) at the most. With respect to the size of the squares, it is wrong to make them more than fifteen or twenty *toises* (30 or 40 m) in one direction, at the same distance; the best squares have sides of from ten to twelve *toises* (20 to 24 m) by fourteen or fifteen *toises* (28 or 30 m). The whole should be determined by the size of the garden. Ordinary paths, used to tend to the squares or the flower beds, are approximately one *pied* (330 mm) wide.[21]

Louis Leger's *La Nouvelle Maison Rustique,*[22] with its lucid elaboration of the principles of French country gardening in the early 18th century, has proven particularly useful as a guide to layout and planting in the reconstruction of the gardens.



Engineer's Garden, Louisbourg, reconstructed from documentary, iconographic and comparative sources of the mid-18th century.

The Engineer's garden, the most elaborate of the Louisbourg gardens reconstructed to date, illustrates well the proportioned design of French 18th century gardens. The sundial at the central crossing of the walks and a few flowers add a little ornament to an otherwise functional garden. It is the only one of Louisbourg's gardens to have a water feature, a fundamental element of the French renaissance style but much less common in smaller gardens than large ones. It is not, as originally interpreted, a pond or pool indicative of French renaissance design in the colonial outpost, but a well-constructed drain designed to alleviate the dampness of the ground and house which derived from Louisbourg's boggy situation.[23] In addition to boggy land, poor thin soil hampered gardening efforts at Louisbourg. In 1740, for example, Intendant Francois Bigot paid 300 livres to cart soil to the King's Garden to make it more effective for gardening, and M. de la Forêt's garden, lauded in 1728 for its good condition, was kept so by his adding new soil and manure to it every year.[24] British military engineer John Henry Bastide, stationed at Louisbourg, grumbled: "...You never Saw Such a Country. No Bright Sun, this month past, and what Sallade I have had, is from ye heat of ye Dung not of the sun."[25] Joseph Lartigue claimed, however, to have drawn annual revenue of 300 livres from his gardens.[26]

Not very much is known historically about what was actually grown at Louisbourg. Trees in the town were rare because defence regulations prohibited their planting within 350 toises (700 m) of the fortifications. Unlike Halifax or Acadia, orchards and fruit trees were apparently not cultivated. Vegetable, kitchen and herb gardens were sown with seeds from France, New England, Acadia and Canada, whence Louisbourg purchased produce and dried vegetables.

At least one escape assumed to derive from 18th century planting still thrives at Louisbourg: *Angelica sylvestris*, highly regarded in France for its medicinal and herbal qualities, is found nowhere else in North America.[27] At Louisbourg, then, as John Flowers has found in the investigation of garden history in North Carolina in the 18th century, "Gardening for profit, as it were, instead of pleasure, remained most pervasive."[28]

New France: Religious Gardens

At Quebec, founded in 1608 and walled as protection against both unfriendly Indians and the English, spacious enclosed gardens were laid out by the late 17th century. Both there and at Montreal extensive lands were assigned to Roman Catholic religious orders, which developed substantial conventual properties, comprising their buildings and large adjoining gardens. The Sulpicians, for example, owned the whole island of Montreal, although their seminary occupied only one large city block as did those of four others – the Recollets, the Jesuits, the Sisters of the Congregation and the Frères Charrons. At Quebec the impact of the religious holdings, mainly in the form of gardens, on the evolution of the Upper Town is clearly visible in a series of maps dating from the late 17th century to the late 18th century – the communities of the Jesuits, the Recollects, the Ursulines as well as the facilities of the Jesuits' seminary, the Hospital and the Bishop's Palace.

Gardens of religious institutions have derived their impetus, function and form from the gardens associated with the monasteries of the Middle Ages. Within the monasteries were enclosed discreet religious communities where the arts of civilization, including literature and scientific knowledge, were protected through the Dark Ages. The ground plan of the monasteries, centering on the church and cloister, reflected the inward-looking and self-reliant nature of these establishments. The monastery garden served a variety of roles: it provided foodstuffs, medicinal plants, water, ritual open space, and cemetery.[29] The garden, in conjunction with the buildings, became the stage for the distinctive religious lifestyle.

With the colonization of New France in the 17th century, this European garden tradition was carried to North America. The spiritual and temporal aspects of the self-contained monastery were transmitted along with the Christianizing zeal which gave the monastic orders their influential role in early Canada. Orders such as the Jesuits and Sulpicians adapted the forms and styles of the medieval monastery in the fledgling settlements. Protection and self-reliance were key features in establishing these religious communities, and their gardens reverted to the impetus, function and forms of the Middle Ages.[30]

Peter Kalm, the Swedish naturalist who visited Canada in 1748-49, described in some detail the usage, plant material and forms of a number of these religious gardens which he observed. At Quebec, for example, he visited the Ursuline Convent where

> The view from the convent is very fine on every side. The river, the fields and the meadows beyond the town appear there to great advantage. On one side of the convent is a large garden, in which the nuns are at liberty to walk about. It belongs to the convent, and is surrounded with a high wall. There is a quantity of all sorts of vegetables in it and a number of apple, cherry and white walnut trees and red currant bushes.[31]

Elsewhere in Quebec, at the Jesuit College, he remarked that

> On the outside is their college which is on two sides surrounded with great orchards and kitchen gardens, in which they have fine walks. A part of the trees here are the remains of the forest which stood here when the French began to build this town. They have besides planted a number of fruit trees, and the garden is stocked with all sorts of plants for use in the kitchen.[32]

In Montreal, gardens also appeared very early in conjunction with religious institutions. The similarity of the layout of these gardens is again visible in a series of early 18th century plans of the city; their designs conform closely to those of the medieval monastic garden. Of these original religious gardens only the Sulpician Seminary garden on Notre-Dame Street survives in its original location and with its form virtually intact.

Garden of the Sulpician Seminary, Notre-Dame Street, Montreal. Ornamental planting and statuary introduced in the parterres nearest the Seminary in the 19th century are still evident.

The walled garden of the Sulpician seminary dates from the construction of the monastery in the 1680s. It is formal in design, the ground being divided in the traditional manner of monastic gardens into a series of parterres by several allées. A plan of 1726 shows nine parterres, the number confirmed in a 19th century sketch and in the surviving garden today.[33] By the early 18th century fruit trees appear to have been planted along certain parterres and the rear wall of the garden. An enumeration of the vegetables, fruit trees and gardener's tasks dating from the end of the 18th century attests the practical nature of the garden activities but also the diversity of its contents: spinach, carrots, potatoes, onions, beets, green beans, chicory, cabbages, celery, artichokes, salsify, broad beans, leeks and aromatic herbs: parsley and chervil. Only a few fruit trees are mentioned: espaliers (no species), apples planted in the fall and pear trees in the spring.[34]

Today, the Sulpician Garden on Notre-Dame Street has been recognized as of national historic significance because of its retention of use, form and considerable integrity from the 18th century to the present.

New France: Secular Gardens

The continuing tradition of European monastic gardens in Canada was one direct link between Canadian and European gardening practice. Another was the official encouragement given by French kings to collect and forward North American plant materials to the Jardin du Roi in Paris. From specimens forwarded in the early 17th century, Jacques Philippe Cornut prepared his *Canadensium plantarum* which first drew attention to the range and suitability of Canadian plant material for introduction to European gardens. At Quebec, Michel Sarrazin, who obtained royal appointment as surgeon-major of the colonial royal troops in 1691, botanized in Canada, sending specimens which still form part of herbarium collections as well as seeds and living plants for the flower beds of the Jardin des Plantes. Among his contributions was his description of Canadian maples. His collections, analyzed by Sébastien Vaillant, a professor at the Jardin Royal, formed the basis of a "Catalogue des plantes du Canada." Jean-François Gaultier [1708-56], appointed king's physician at Quebec in 1741, continued Sarrazin's work, in part by preparing a memoir on plant collecting ordered by governor La Galissonière, which was "distributed to all the commandants of forts, thus creating a network of bases for cataloguing and collecting specimens;" at Quebec Gaultier coordinated shipment of the returns to Paris. He had the garden of the Intendant's palace at his disposal, which he used as a transit nursery and where he seems to have kept a permanent collection of Canadian plants. He sent seeds, bulbs and slips to the Jardin du Roi and contributed to popular medicine, botanical pharmacopeia, and the use of woods. He prepared a 400-page manuscript on the plants of Canada for Duhamel Du Monceau, his sponsor, who used it in preparing his *Traité des arbres et arbustes*.[35]

It would be misleading to leave off discussion of gardens and gardening in New France after consideration of only the activities of the religious congregations and royal officials. In fact, survival in Canada demanded reliance upon the soil, and from Canada's first farmer, Louis Hébert, there is continuing evidence of subsistence cultivation. American landscape architect Kenneth Helphand, in describing the garden as "agriculture's art," has argued that "agriculture is perhaps the most significant process from which gardens have derived...Both agriculture and the garden are products of the domestication of plants. Although history shows the garden gradually transcending the more utilitarian function of food production, it still is a place of organic ritual..."[36] This perception is strongly evident in both travellers' accounts and the historiography of early Canadian settlement. Pierre Boucher, in the 1660s, for example, remarked not upon the form or nature of cultivation but upon what grew: "All sorts of seeds are sown in the fields, as well as in the gardens, and all come up very well,...notwithstanding the length of the winters." He continued:

> All sorts of turnips and radishes, beetroots, carrots, parsnips, salsify, and other roots grow perfectly well and very large. All sorts of cabbages also grow here in perfection, with the exception of cauliflowers, which I have not seen here yet.
>
> As for other plants, sorrel, chards of all shapes, asparagus, spinage, lettuces of all sorts, chervil, parsley, endive, burnet, onions, leeks, garlic, chives, hyssop, borage, ox-tongue, and generally all sorts of plants that

Plan de la Ville de Quebec, ca 1844. The properties of the religious communities gave a spaciousness to the town which travellers noticed. a) Jesuits' Garden. b) Recollet's Seminary and Garden. c) Ursulines' Convent and Garden. d) Jesuits' Seminary and Garden. e) Hospital and Garden. f) Bishop's Palace and Garden. g) Intendant's Dwelling and Garden. (Courtesy Public Archives Canada, National Map Collection 1604).

grow in gardens in France, melons, cucumbers, watermelons and gourds grow very well here.

As for flowers, none have yet been brought from France except roses, carnations, tulips, white lilies, holly hocks, anemones and lark spur, which do just as well here as in France.[37]

Robert Sequin, in his studies of 17th and 18th century habitant life, noted that parish curés were called upon to bless the gardens. In the extensive legal records which survive in Quebec he found evidence of the cultivation of all sorts of root crops – such as we have already seen growing in the monastic gardens of Quebec and Montreal – and by the mid-18th century the planting of shrubs – such as red currants and gooseberries – was common.[38] Thomas Anburey, travelling between Quebec and Montreal in the 1770s, noted, as Peter Kalm had 20 years earlier, that while some of the farmhouses which lined that route had orchards, most did not, but all had "exceeding good kitchen gardens." At Montreal, however, Kalm saw "some very fine pears and apples of various sorts" as well as plum trees.[39] By the end of the century, Le Comte de Colbert Maulevrier observed that at Montreal apples were grown in orchards and were good; pears were of little variety and were mediocre; plums were grown but he couldn't assess their quality; cherries grew very well, and grapes adequately. Kalm had noted the presence of French grapevines – both red and white – in Montreal gardens in 1748-49. There were even some carefully cultivated peaches in Mr. MacGuill's [McGill's?] garden, but the winters were too harsh for them to become common in Montreal. At Kingston the Count saw the fruit of mulberry trees as big as small chicken's eggs, harvested from stock in its second season of production. Peter Kalm had also seen mulberry trees, in the Baron de Longueuil's garden on the Ile de Madeleine, which he was told had been planted there about 1730 after having been brought in from "more southerly parts" for they did not grow wild so far north. Sassafras, waterbeech, and red cedar, none of which grew wild in the region, had also been successfully planted into the governor's garden.[40]

Loyalists and Officials

The question of where plants introduced into gardens came from is worth pursuing. Kalm noted the introduction of both indigenous plants –eg. wild grapes – and plants imported from Europe, such as parsnips, into the gardens of New France. James Monk, the first Solicitor General of Nova Scotia, has left us a detailed record of the garden he cultivated in retirement in 1767-68; all his seeds whose origins are identified came from neighbours, although newspaper advertisements make clear that imported seeds were available in Halifax much earlier.[41] The Loyalist era, which saw thousands of American settlers move to British North America in the 1780s, has left extensive records of importations. Among these are the seeds the British government provided to Loyalist settlers to assist them in establishing themselves in the new land. In addition, however, leading Loyalists themselves, intent upon recreating the lifestyle they had abandoned, placed orders directly with both American dealers and British nursery firms. "Many in this Province [New Brunswick] are desirous of having the best grafted fruit as well as Seeds from England," wrote Ward Chipman to Hewit, Smith & Co. at Brompton near London. His three page list, which specified varieties as well as species –eg. 12 each of Green Gage and Orleans plums, 6 each of Amber, Damson, White and Pear plums – also incorporates careful shipping instructions to ensure their safe arrival. This was a follow-up order, on behalf of a neighbour, Chipman's own initial order having

been placed with Hewit, Smith & Co. in 1784, the first year of his settlement in the province.

By the late 18th century, a wide variety of garden seeds and products were available, at least in Nova Scotia. Mary Harvey, in her study of Loyalist gardens for the restoration of the Ross-Thomson House in Shelburne, identified 75 vegetables, herbs, trees and some flowers, totalling almost 200 varieties, which were grown in the town prior to 1820.[43] Like the earlier gardens at Louisbourg, they were cultivated, except in rare cases, for medicinal and culinary uses. Garden forms remained simple, owing their layout to the English cottage garden and its American adaptations.[44] Locally published almanacks provided gardening calendars adapted from such English classics as Thomas Mawe and John Abercrombie's *Everyman His Own Gardener* (1766), Philip Miller's *The Gardener's Kalendar* (1759) and John Mills' *Practical Husbandry* (1767).

By the end of the 18th century, settlers, and especially officials, arriving from Britain brought with them not only the knowledge of the older garden traditions which, as John Harris has shown,[45] survived in the age of Capability Brown and pastoral landscaping; they also brought the contemporary picturesque vision. The close of the century in Britain saw animated controversy between proponents of the smooth, graceful improvements of the sublime and beautiful, well-established there since the 1750s, and those who favoured the wilder, sudden irregularities of the picturesque. [46] In the forested wilderness of North America, settlers and travellers found reinforcement of the picturesque's association with Nature, and they responded by incorporating into their gardens the natural landscape and flora which, in England, they would have had to create

Castle Frank, near Toronto, 1796. Sited to capture the vista including the flowing river, Mrs. Simcoe's rural cottage was built of local wood, 16-foot peeled pine trunks forming the portico. To supplement the fruit bushes already on the site, she planted currant bushes and peach trees. (Courtesy Archives of Ontario)

or introduce. Mrs. Simcoe, for example, noted at Isle Madame, the "bold perpendicular dark Red rock" and "some large blasted Pine quite white [which] had a wild fine effect;" elsewhere, in Upper Canada, "the hill [was] quite like a park, fine turf with large Oak trees dispersed...quite natural, for there [were] no settlements near it."[47] Castle Frank, built for Lieutenant-Governor Simcoe and his wife in 1796, captured the picturesque potential of the North American landscape. With tree-trunk columns upholding a classical pediment, it was sited atop a steep wooded bank overlooking the Don Valley. In its grounds they planted currant bushes and peach trees. In Nova Scotia, the partially preserved grounds of Prince's Lodge, overlooking Bedford Basin, are one of the earliest known examples of the English landscape style in Canada. Laid out for Edward, Duke of Kent, while he was commander-in-chief in the 1790s, the site had excellent views over abundant water, mature beech and birch woods, outcroppings, and serpentine paths traversing the forest.[48] The circular music pavilion, which alone survives of the estate's architectural features, recalls the classical temples of the great 18th-century English gardens like Stourhead and Stowe. Extensive adoption of the principles of the English landscape style in Canada was, however, a 19th-century, not an 18th-century, phenomenon.

To conclude, then, were 18th century Canadian gardens "good gardens full of garden stuff"? Obviously some were, some of the time. In the absence of markets and large fields, they were essential sources of fresh food stuffs. Gardening, however, was often an uphill battle against climate, insects, poor soils. It involved hard work and patience, and as many cultivators complained, they often did not return a good investment on the amount of labour expended. While flowers were certainly grown, outside the properties of the social elites, gardening generally had not moved very far along the continuum Helphand describes between "a garden that is entirely agricultural and functional in purpose, as in the kitchen garden, vegetable garden, vineyard, fruit orchard or physic garden" towards "a garden completely transformed and spatially removed from its agricultural roots, its origins lost through its development into a place of leisure, artistry and pleasure."[49] Canada in the 18th century, as a result of both political upheavals and new settlement, remained very much the "new founde land," whose potential vigorous 19th century development would exploit.

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Traduction de Céline Arsenault, Jardin botanique de Montréal.

REPORT

Early garden practices. Third Canadian Garden History Symposium. The Old Mill, Toronto, April 3, 1986.

Since 1984 Humber Arboretum of Rexdale, Ontario, has sponsored an annual one-day symposium on Canadian garden history. Each symposium brings together about 50 participants – landscape and garden history researchers and writers, museum and historical site personnel, librarians, archivists and curators, landscape architects and garden designers, amateur and professional gardeners and horticulturists. Speakers contribute original research on historic gardens and landscape restoration projects, practical information about research and restoration techniques, plant selection and sources, and on historic landscape maintenance.

Peter Stokes, restoration architect, began with the Upper Canada Village project of 1958-1961. "To some here, it will seem very amateurish now; it was a long time ago. But it was a very exciting time, and we made some great steps," he commented. The Gardening Committee consisted of decorative arts specialists Jeanne Minhinnick; architectural historian Vershoyle Blake; horticultural advisors Louise Heringa, Minerva Castle, Mary Eliza Blacklock, Thelma Boucher and Peter Stokes, restoration architect.

The Village was created of buildings moved from land to be flooded by the St. Lawrence Seaway project. Its overall layout had been designed by St. Lawrence Parks Commission staff, and time was too short for adequate landscape archaeology at the original building sites. The Gardening Committee – its name expressing its limited role – had therefore to concern itself with research, planning, plant hunting, and the creation of a filler of forest trees, hedgerows, fruit trees, plus individual plantings for each building. In creating the plantings, local examples were used where possible, and appropriate plants were collected from the bush and salvaged from abandoned house sites when available. Annuals and biennials were chosen from an 1835 Carters' seed list, most of whose listings could still be supplied by the company. The Committee showed great sensitivity toward 19th century plants and gardening styles, and created a series of very charming gardens. Photographs from the 1960s showed individual gardens filling in nicely and the village as a whole looking as sparsely treed as an 1840s watercolour of almost any village in Upper Canada. After about ten years, Stokes felt, woody vegetation was becoming too tall, too lush. In retrospect, it is very clear that there is a need for a statement on maintenance objectives and an ongoing maintenance plan for a landscape historical project.

Dr. Emil Andersen, a pomologist, in his talk "Popular Apples in Ontario, 1830-1930," explained that the quality of hedgerow and other seedling apples is highly variable because the apple is genetically "very mixed up." Our 'McIntosh' apple originated from a seedling which John McIntosh transplanted in 1810-11 from a creek bed near his Dundela farm in what is now eastern Ontario. Early orchards, started from seed, scions, or budwood brought by settlers, were variable not only in fruit quality but also in growth habit. A 19th century

orchard, because it contained trees from variable root-stock and topstock, was irregular in height, trunk diameter, and tree silhouette. Trees were planted as much as 10-12 metres (35-40 feet) apart), and the prevalent style of pruning created a low vase-shaped tree, often with resultant splitting of weak crotches. By contrast, today's orchard of a few cultivars grown from uniform rootstock is compact (with trees as close as 1.5 metres (five feet) apart, in the case of recently-planted dwarf trees,) is pruned to a strong central leader, and is uniform in overall appearance.

Andersen credited the Fruit Growers' Association of Ontario, founded in 1859, with disseminating knowledge of apples in Ontario and urged the establishment of experiment stations which preceded the Horticultural Research Institute of Ontario, at Vineland Station. Their observations lead to reports such as *Fruits of Ontario* (Toronto: Ontario Dept. of Agriculture, 1906; 1914). The 1914 edition listed 85 apple cultivars, nearly all of which originated in the 19th century. While it is true that older varieties are disappearing from the general market, the reasons are varied, Andersen said. 'Baldwin' was widely grown in middle and southern Ontario according to the 1914 report but, because it is not very hardy, many trees were killed by the severe winters of 1917-18 and 1933-34, and replaced by hardier cultivars. 'Northern Spy', recommended for market production in 1914, is now considered less than ideal being susceptible to fire blight. 'Yellow Transparent', described as "second class" in 1914, was later found to be susceptible to fire blight. This apple is now hard to find; whereas 'Northern Spy', always desirable as a good canner and keeper, is still widely grown. 'Red Delicious', originated in Iowa about 1870, now the most widely grown apple in the world, was not mentioned in *Fruits of Ontario*. Today's very red apples on compact spur-type trees — such as 'Miller Spur', 'Red Chief', and 'Star King' are mutations of 'Red Delicious'. Andersen predicted that new apples will continue to appear, although with less frequency than during the 19th century. For those interested in seeing, tasting and propagating old apples the Centennial Orchard at Vineland Station is being replaced by a new apple museum orchard of 69 pre-1914 cultivars.

John Bradshaw's paper, "History of the Rose", was of a very general nature because, he explained, an influenza attack kept him from doing further research. This was a great disappointment because Bradshaw, with his knowledge of roses could have illustrated and described the flowers and habits of roses once grown in this country. And they were grown here. For instance, Canadians could purchase 22 different roses through the 1827 catalogue of William Custead's Toronto Nursery; and by 1913 Toronto had enough rosarians to form the Rose Society of Ontario — which in 1954 became the Canadian Rose Society.

Next, and contrasting well with Stokes' review of a large-scale project, John Stewart, landscape architect, presented his firm's work-in-progress at "Maplelawn," the Rochester House in Ottawa, Ontario. The neoclassic house was built in 1834 by the William Thompson family, which also created its garden: a cruciform arrangement of paths and rectangular beds enclosed by a 1.8 metre (six-foot) stone wall, which still exists. In 1877 the property was sold at auction to the Cole family; in 1935 to the Rochester family; and in 1952 to the National Capital Commission (NCC). (It is not yet open to the public.)

Last year the NCC asked Stewart's firm to document the history of the property: to prepare an 'as-found' survey; to develop a policy for restoration of the site; to prepare working drawings and specifications; and to develop an

interpretive program. It was found that not enough information survives to restore the garden to the Thompson or Cole periods, although there are a few leads indicating what may have been grown in the garden in the 19th and early 20th centuries. On the other hand, in the 1940s the Rochester family had asked Warren Oliver to draw up a new planting plan for the walled garden. Mr. Oliver was an experienced plantsman who served for 15 years as senior horticulturist in ornamentals at the Central Experimental Farm, Ottawa. His 1940's plan and 1950's photographs still exist. Mrs. Rochester, now in her eighties, active and interested in the garden, also proved to be a valuable source for information. By laying the 'as-found' garden plan on Oliver's 1940 plan, Stewart discovered that many of the plants Oliver specified are still growing in the garden – although 60 percent seem to have migrated somewhat from their original spots. The consultants therefore have recommended to the NCC to restore the walled garden to the 1940s.

Mr. Russell Ferguson, head-gardener, spoke about the gardens at Bellevue House. Russell's presentation contained much sound advice and practical solutions to problems of maintaining an historical garden as part of a site open to the public and surrounded by a modern neighbourhood. In the late 1840s, John A. MacDonald, later to become Canada's first Prime Minister, lived with his invalid wife and baby son at Bellevue House in Kingston, Ontario. Parks Canada has restored this Italianate villa, completed after 1841, to the MacDonald period. The grounds follow the layout shown in an early site plan. An experienced historical interpreter, horticulturist, and manager, Ferguson realises the need to answer visitors' questions with plausible stories as long as he "balances authenticity with expense." He and his two gardeners may explain that a barrel is in the garden for letting well water warm up; and if they must fill a rain barrel with tap water, they never do so during the day or in rainy weather. He selects and buys seeds for each year's planting, but turns it over to outside contractors who produce plants for setting out. Anachronism at an historical site is always a problem and therefore he insists that all the work is done in period costume, using period tools and that contracted-out plants in their plastic containers are planted out before visiting hours, by staff in modern dress. Also to keep children from climbing young orchard trees, gardeners pick the apples early. Throughout the gardening season, Bellevue House gardeners offer visitors hands-on experience.

Gardeners at Bellevue House work with reproductions of mid-19th century tools: old-style dandelion spikes, trowels, and hoes; a scythe for haying the orchard and sheep shears for grooming the lawn ; a garden rake with riveted teeth for smoothing the gravel walks (augmented by a fan rake before hours); a yoke with wooden buckets for carrying water, and the Haws watering cans which, although they came along in the 1860s, resemble earlier models. Gardeners wear straw hats, loose shirts, buttoned-fly trousers, leather vests, and high boots. In very hot weather, they may take off their vests, provided they are hung on the nearby fence.

Ferguson is also aware of the delicate balance between historical integrity within the site and neighbours' opinions beyond it. A small orchard of old apples beside the house helps buffer it from the street, and from the out-of-period trees neighbours are reluctant to see cut down along the boulevard. Trees beyond the property line buffer the vegetable garden, but shade it heavily along one side. Through trial and error Ferguson has discovered that buckwheat thrives in that location, where it serves both as a groundcover and as green manure.

Because of his attention to all these many details in successful historical garden maintenance and interpretation, participants from other historic sites found Ferguson's talk particularly helpful. Too often, interpretation workshops focus entirely on the insides of historic buildings.

It was a rewarding day. Humber Arboretum, in organizing these symposia, makes a significant contribution in the emerging field of Canadian landscape and garden history.

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BOOK REVIEW

Rhetoric and Roses: A History of Canadian Gardening, 1900 - 1930, by Edwinna von Baeyer. Markham, Ont.,: Fitzhenry & Whiteside, 1984. Can. $29.95. ISBN 0-88902 - 983 - 0.

In spite of its unfortunately posey title, Edwinna von Baeyer's *Rhetoric and Roses* provides an invaluable service for the historians of gardens and landscape in Canada. Although it is by no means exhaustive, it covers many of the 'bases' that need to be touched.

It is the fate of pioneering books of this kind that, by providing both a framework and a forum for attention, they subsequently encourage the appearance of a great deal of material that had previously been unrecorded. This is especially so in Canada where garden history (as this journal testifies) is a very new discipline — one in which it has been difficult to know what else has been and is being done in the field. Only with the co-ordination of that research and attention will come an increased awareness of our garden heritage and a pressure to preserve what remains — a subject rightly dealt with by Susan Buggey in her afterword to this book.

Perhaps it is equally inevitable in a pioneering work that much of the information is of the 'reputedly' and 'we are told' kind, though Ms. von Baeyer should know that William Robinson was not Scots, but Irish, and that *Canadian Wild Flowers*, although published by Anges Fitzgibbon, was written by her more famous sister, Catherine Parr Traill. There are also features of production in which her publishers were lax: photographs are often without dates or even captions, footnote numbers are almost invisible in the text, and the index is very inadequate.

The word *garden* is an elusive one, and for some readers this book will seem to have concentrated on the kitchen garden (The School Garden) or botany (Horticultural Writing in Canada, Plant Breeding in Canada) at the expense of planning and design. It seems a pity, for example, that the book starts so late and covers so brief a period: 1900-1930. (It would have been more honest of the publishers to include these dates on the dust-jacket.) As a consequence, many of the early landscape gardens (especially in the Maritimes and Quebec) are omitted. Even such Toronto gardens as The Grange and Spadina, or Dundurn Castle in Hamilton, are too early for the author's consideration.

This is a very democratic book; it interests itself in the doings of ordinary people. This is inevitable, given the book's sociological stance: gardens as a tool of social reform. Unfortunately, few gardens of lasting interest have been created in this way – though the Public Gardens in Halifax (not treated here) are a notable exception. Where Ms. von Baeyer's book brightens is in Chapter 5, in which she deals with 'gardens of note'.

Most of us know about the origins of the Butchart Gardens in Victoria, but Mrs. Reford's Métis Park in the Gaspé Peninsula, Van Horne's Covenhaven (on Minister's Island off St. Andrews, N.B.) and (most astonishing of all) Mrs. Partridge's Ben-My-Chree in the Yukon all show that, by the early 20th century, 'world-class gardens' (to use that overworked phrase) were being created in Canada. The taste for Japanese gardens, rock gardens, and ferneries at that time, moreover, indicates that Canadian gardeners on this scale were fully aware of contemporary international developments. Mrs. Butchart, for example, was able to astonish the discoverer of *Meconopsis betonicifolia* Franch. with an example of it in her garden very shortly after its discovery.

Here is a history of which we can rightly be proud. Edwinna von Baeyer has shown both how it can be written and needs to be.

Douglas Chambers
Trinity College, University of Toronto

Available from the Royal Botanical Gardens, P.O. Box 399, Hamilton, Ontario, Canada. L8N 3H8.

Request for information

Andre Parmentier (1780-1830) emigrated from Belgium to the United States, and established a nursery at Brooklyn, New York. He soon became respected not only for his horticultural skill but for his skill as a landscape designer. A.J. Downing spoke admiringly of Parmentier in *A Treatise on the Theory and Practice of Landscape Gardening* (1841) and, in his discussion of Parmentier's work (pp. 24-25 in the 1875 edition),said:

> ... Two or three places in Upper Canada, especially near Montreal, were, we believe, laid out by his own hands and stocked from his nursery grounds...

Documents in Toronto relating to the construction of the original Upper Canada College, Toronto, recorded an 1830 payment of £25 for a plan, made to the widow of Mr. Parmentier in New York, and of payments for plants from New York. The Upper Canada College grounds may or may not have been among the places in Canada to which Downing referred.

For help in interpreting Downing's statement and documenting Parmentier's role in Canadian landscape history, I would appreciate hearing from you if you know of other references to, or research on, Andre Parmentier's work in Canada.

Please contact: Pleasance Crawford
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or telephone (416) 922-7997

Colloque du Centenaire du Frère Marie-Victorin. Bulletin de la Société d'animation du Jardin de l'Institut botaniques (SAJIB), vol. 9, no. 3, 1985. 94 pp.

This special issue of the Bulletin de la Société d'animation du Jardin et l'Institut botaniques (SAJIB) has been devoted to the life of Brother Marie-Victorin (born Conrad Kirouac, 1885-1944), who was the founder of the Montreal Botanical Garden and of the *Institut de botanique* of the University of Montreal. Besides his many contributions to the North American flora, especially of the province of Quebec, he is the author of the *Flore laurentienne*. He made several botanical field trips to Cuba. The *Herbarium Marie-Victorin* of the University of Montreal is one of the largest in Canada. The eleven articles of this issue deal with various aspects of Brother Marie-Victorin's life, his priesthood, as well as his career as a professional botanist, administrator, educator and author. These are the proceedings of a conference, celebrating the centenary of Marie-Victorin's birth, held at the Montreal Botanical Garden on 13 April 1985. An up-to-date bibliography completes this valuable contribution, illustrated with many black/white photographs.

Copies can be obtained from: Société d'animation du Jardin et de l'Institut botaniques, 4101, rue Sherbrooke Est, MONTREAL, Quebec, Canada. H1X 2B2.

Price: Can. $5.50 (includes postage). Please enclose payment with your order. Cheques to be made payable to SAJIB (written in capital letters).

The development of horticulture on the Prairies: an historical review, edited and compiled by Harold S. Fry. Western Canadian Society for Horticulture (WCSH), 1956. 184 pp. Reprinted by WCSH, 1986. 227 pp + index.

In 1955 a group of professional horticulturists, members of the *Western Canadian Society for Horticulture*, which was founded in 1943, made a concerted effort to record the pioneer history of horticulture of the three prairie provinces, Alberta, Saskatchewan, and Manitoba. The above publication has now been re-issued, enhanced with a table of contents.

Copies can be ordered from the WCSH History Committee and mailed to Roger Vick, University of Alberta Devonian Botanic Garden, University of Alberta, EDMONTON, Alberta, Canada. T5G 2E1. Please enclose your cheque for Can. $15.00 (includes postage). Cheques to be made payable to: WCSH History Committee.

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Stothers, D.M., & R.A. Yarnell. 1977. An agricultural revolution in the lower Great Lakes. *In:* Romans, R.C., ed. Geobotany. New York and London: Plenum Press. pp. 209-232.

Thesis or dissertation.

Waterston, C.M. 1978. The Hermitage: an exercise in landscape reconstruction. M.Sc. thesis, University of Guelph. ix + 137 pp.

Journal article.

Schuyler, D. 1984. The evolution of the Anglo-American rural cemetary: landscape architecture as social and cultural history. J. Gard. Hist. 4:291-304.

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